Session 301

Mac OS X Server Overview

Eric Zelenka
Product Line Manager, Server Software

Introduction

A great desktop experience requires great network services

- Apple's Server Strategy
- Technology Update
- Developer Opportunities

What You'll Learn

- What is Mac OS X Server?
- How does Mac OS X Server relate to Mac OS X?
- What are the opportunities for developers?
- Where can I learn more?

Apple's Server Strategy

- Deliver innovative, scalable solutions based on Internet and industry standards
- Premier platform for high-performance, easy-to-use networking, workgroup and Internet server solutions
  - Easiest to manage and administer
  - Full suite of services
  - Integrate into existing infrastructures
  - Embrace standards
- Provide clients with the best desktop computing experience

What Is Mac OS X Server?

Ease-of-use of AppleShare IP plus power and innovation of Mac OS X

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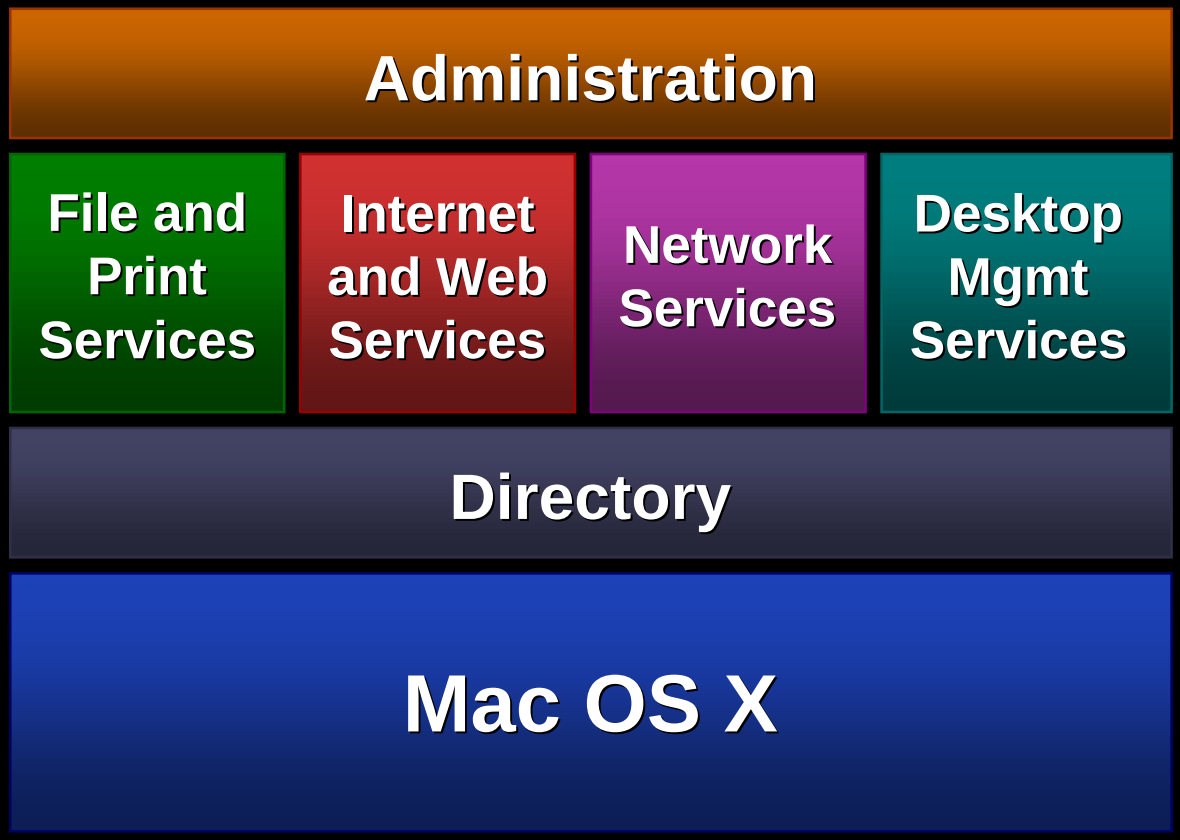
What Is Mac OS X Server?

- Industrial-Strength Server Platform
  - Built on Mac OS X, Darwin and Open Source
- Integrated Server Services
  - File and Print
  - Internet and web
  - Networking
  - Desktop Management
  - Directory Services
- Superior Ease of Use
  - Aqua, Secure Remote Administration

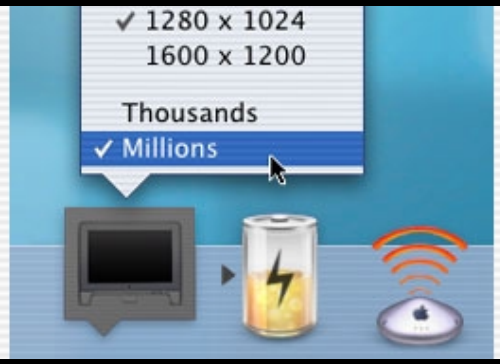
Mac OS X Server Services



Mac OS X and Mac OS X Server Comparison

- Similarities
  - UNIX-based Darwin operating system foundation
  - BSD networking
  - Aqua user interface
- Differences
  - Mac OS X Server is a “Server Platform”
  - Offers a range of server services
  - Integrated remote administration, management, logging
  - Fault tolerance systems
  - Additional open source and Apple-designed solutions
  - It is a Complete Solution!

Mac OS X Server
Platform and Services



Greg Burns
Director, Internet Server Software

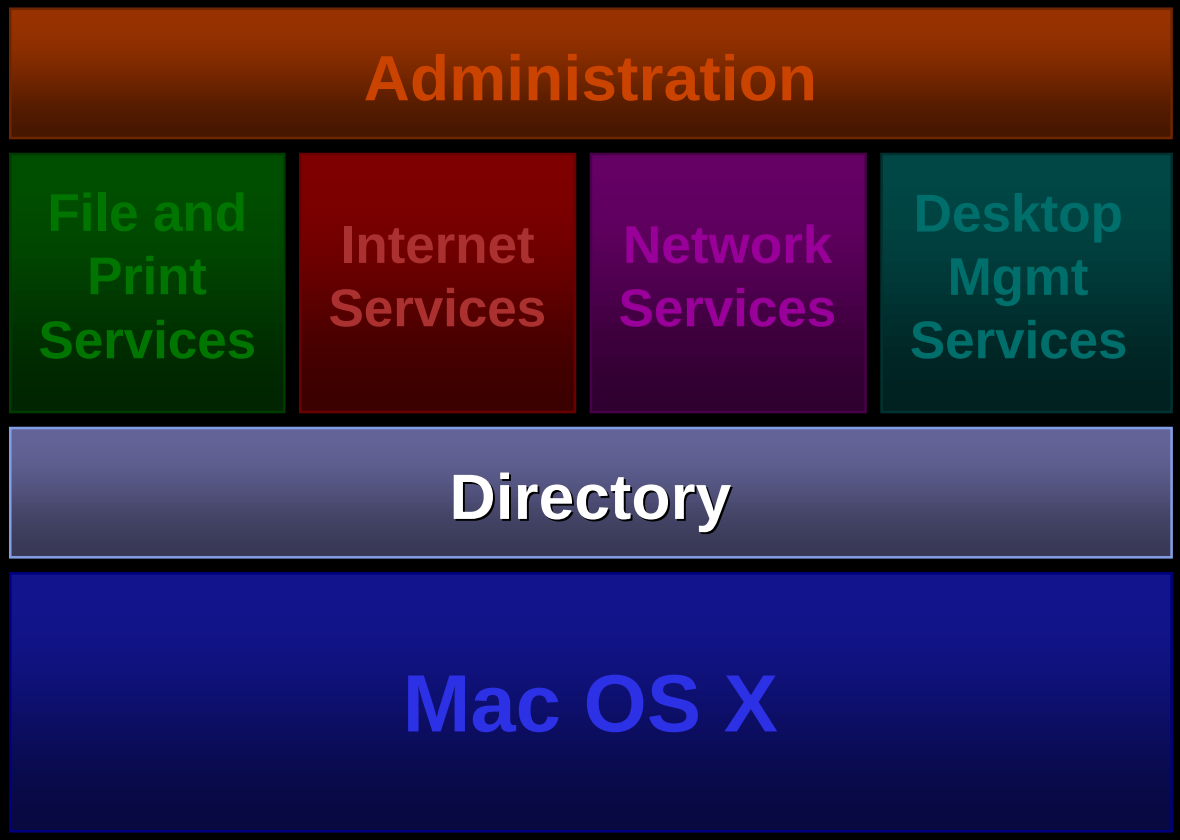
Industrial Strength Server Platform

- Darwin
  - Mach 3.0, FreeBSD, open source
  - Preemptive multitasking
  - Protected memory, reliability
- Unix-based OS foundations
  - File system and networking
  - HFS+, UFS, NFS, AFP, more…

Industrial Strength Server Platform

- Scalability
  - Performance
  - Symmetric Multiprocessing
- Fault tolerance systems
  - Service and system restart

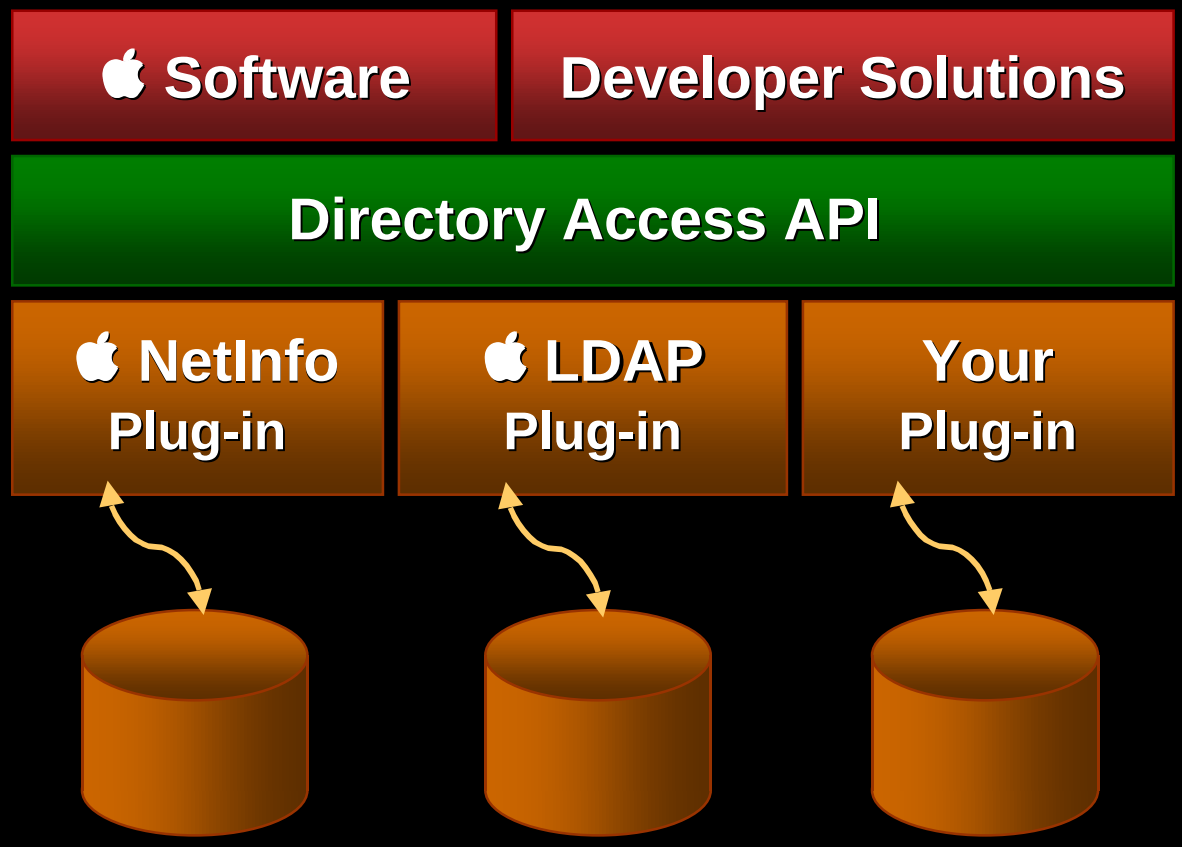
Directory Services



Directory Services

- Integrated directory services in Mac OS X Server provides a distributed directory for Mac OS X desktop and Server
- Allows all applications to share information about users and network resources
- Utilized by all services in Mac OS X Server
- Integrated LDAP support allows Mac OS X Server to integrate with existing directories

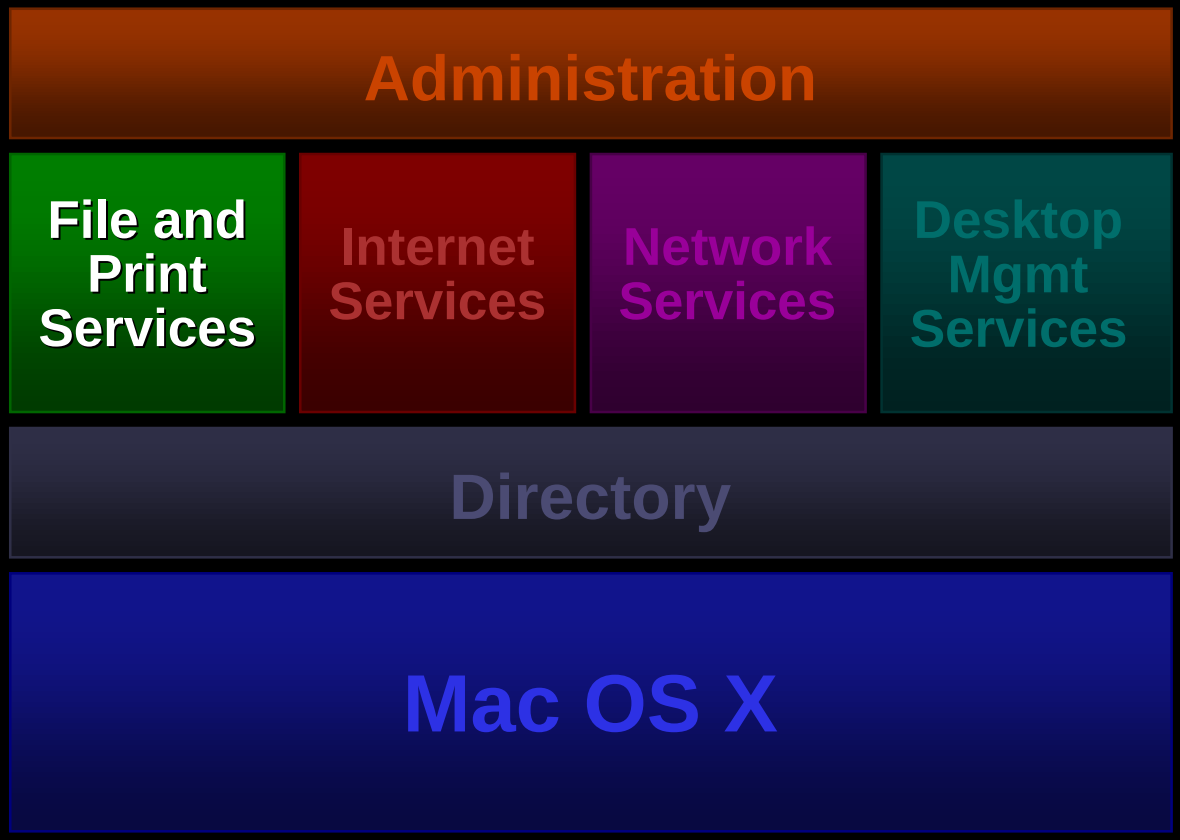
Directory Architecture



Directory Services API

- Included with Mac OS X desktop and server
- Allows access to any directory
- Directory APIs provide a central authentication authority
- Extensible via runtime plug-in architecture
- NetInfo and LDAP client support included in OS

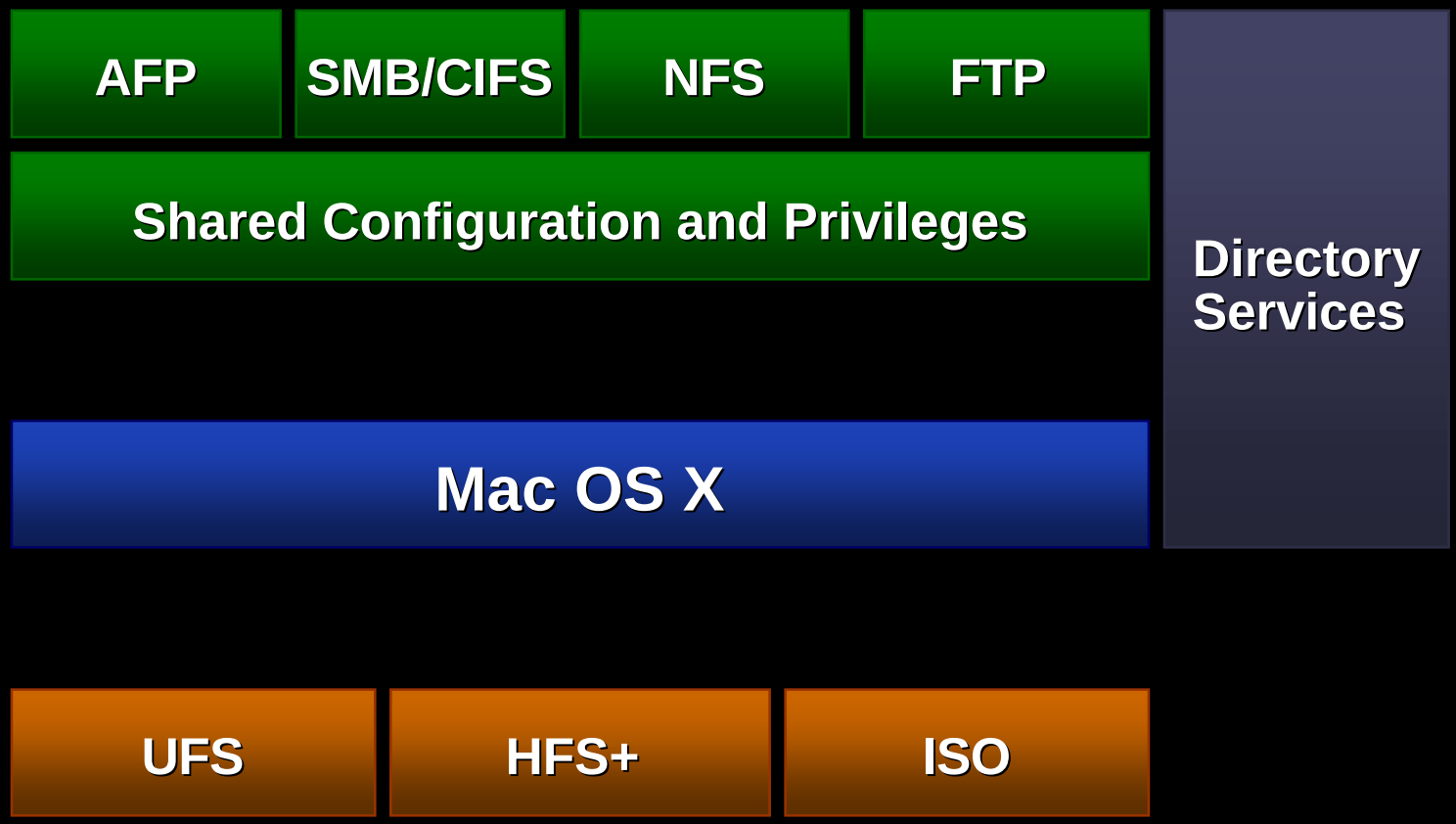
File and Print Services



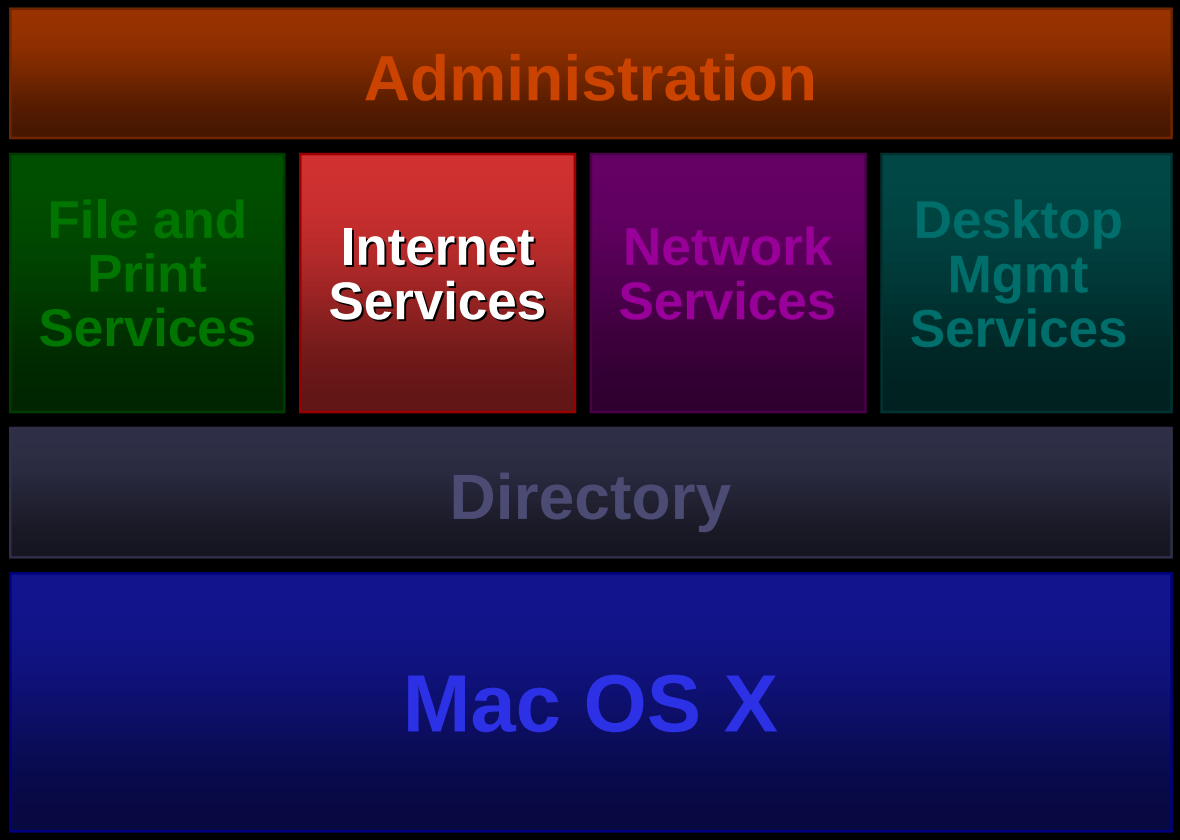
File and Print Services

- Reliable, high-performance network storage
  - Fastest server for Mac OS and Windows clients
- Allows direct storage access from any platform—Macintosh, Windows, UNIX, Linux
- AFP, SMB/CIFS, NFS, and FTP file services
  - AFP 3.0
  - HFS+, UFS, other file systems
- PostScript printer sharing for LPR and SMB clients
- Fully integrated with Mac OS X Printing—Print to any Mac OS X—supported PostScript printer

File Services



Internet Services



Internet Services

- Mail Server
- QuickTime Streaming Server
- Web Services
- WebObjects 5 Deployment

Mail Server—Details

- An integrated and easy-to-use, mail server for Mac OS X Server
- High-performance message store
- Integrated with directory services for mail delivery and routing
- IMAP administration port
- Integrated SMTP/POP/IMAP server
  - Can optionally work in conjunction with Sendmail for advanced configurations

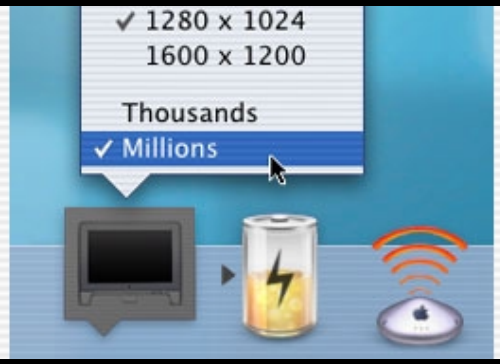
QuickTime Streaming Services

- Deliver high-quality live and on-demand digital media across the Internet
- Standards-based server and relay
- Open source, multiplatform
  - Mac OS X Server, Linux, Solaris, FreeBSD, Windows NT & Windows 2000 Servers
- Over 135,000 downloads

QuickTime Streaming Services

- New with QTSS 3.0
  - Easy web administration
  - Broadcast automation
  - Skip Protection
  - Digest/MD5 authentication
- Performance
- Powerful plug-in API

Mac OS X Server
Web Services



Rusty Tucker
Mac OS X Server Engineering

Web Services

- Overview
  - Apache + Open Source and Apple additions
  - Easy to use local and remote management
  - Front-end performance cache
  - Secure Sockets Layer
  - Caching proxy

Web Services

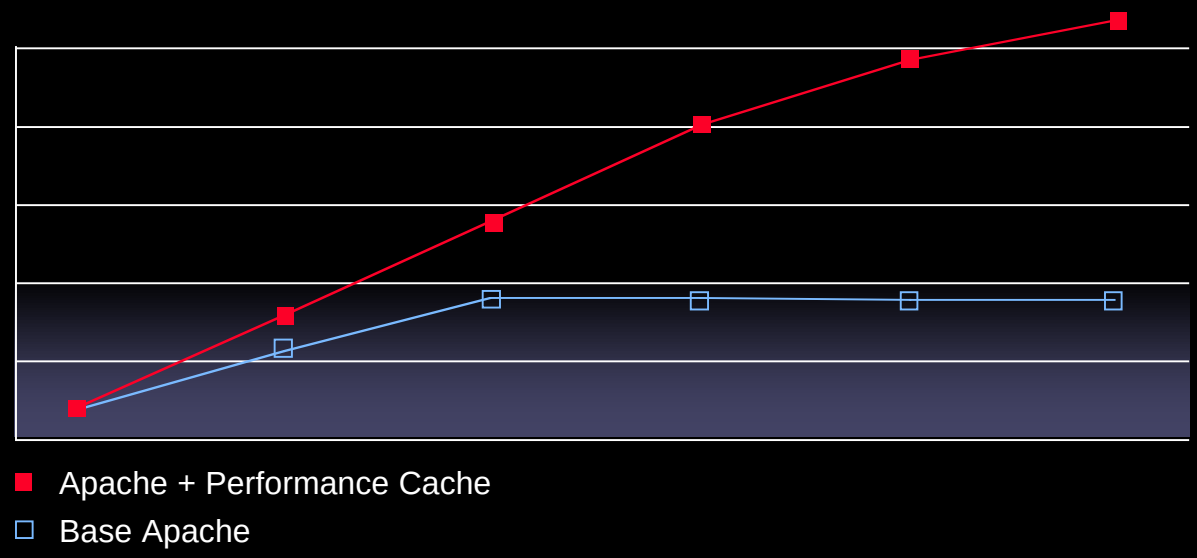
- Web Application Platform
  - WebObjects—Top rated application server
  - MySQL—multi-user SQL database
    www.mysql.com
  - PHP—'C' like scripting, database access
    www.php.net
  - Perl—text manipulation, database access
    perl.oreilly.com
  - Tomcat—Java Servlets, Java Server pages
    jakarta.apache.org

Web Services

- Apple additions/how we integrate with Mac OS X
  - Apple Technologies
    - Sherlock
    - Directory Services
  - Legacy Support
    - Mac OS ACGIs—move to a native technology
    - Macbinary
  - WebDAV—Support in Mac OS X desktop and tools

Web Services

- High-performance Web Server
  - Apache serves17.9 million sites—Netcraft April 2001 survey
- Performance Cache



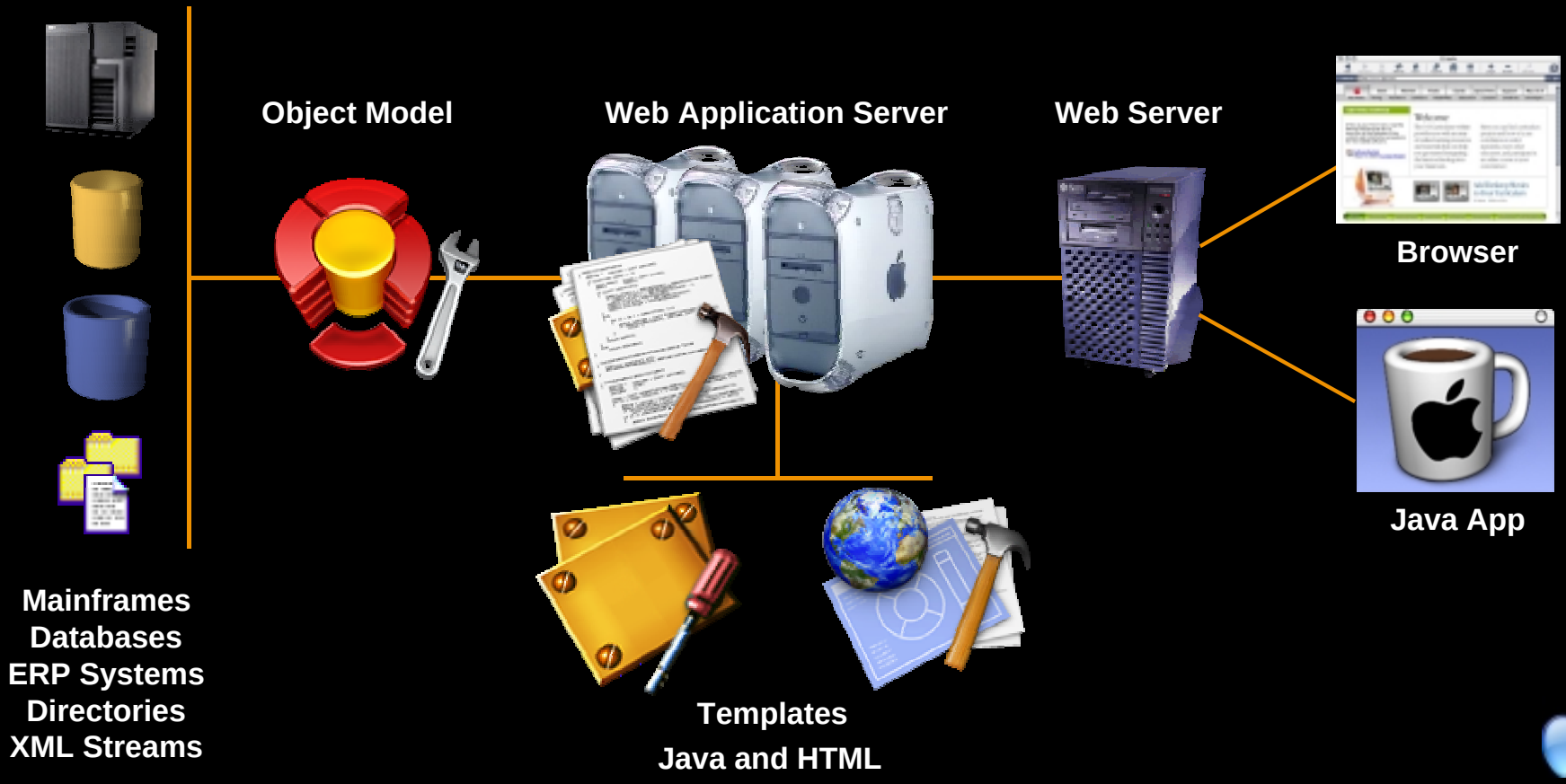
Web Services

- Developing Web Services on Mac OS X Server
  - Take advantage of the performance cache
  - Web Developer Opportunities
    - Apache plug-in development for Mac OS X Server
    - Management tools for Mac OS X Server platform
    - Web applications built with WebObjects, PHP, or Tomcat
- Developer resources
  - **www.apache.org, www.apple.com/developer**

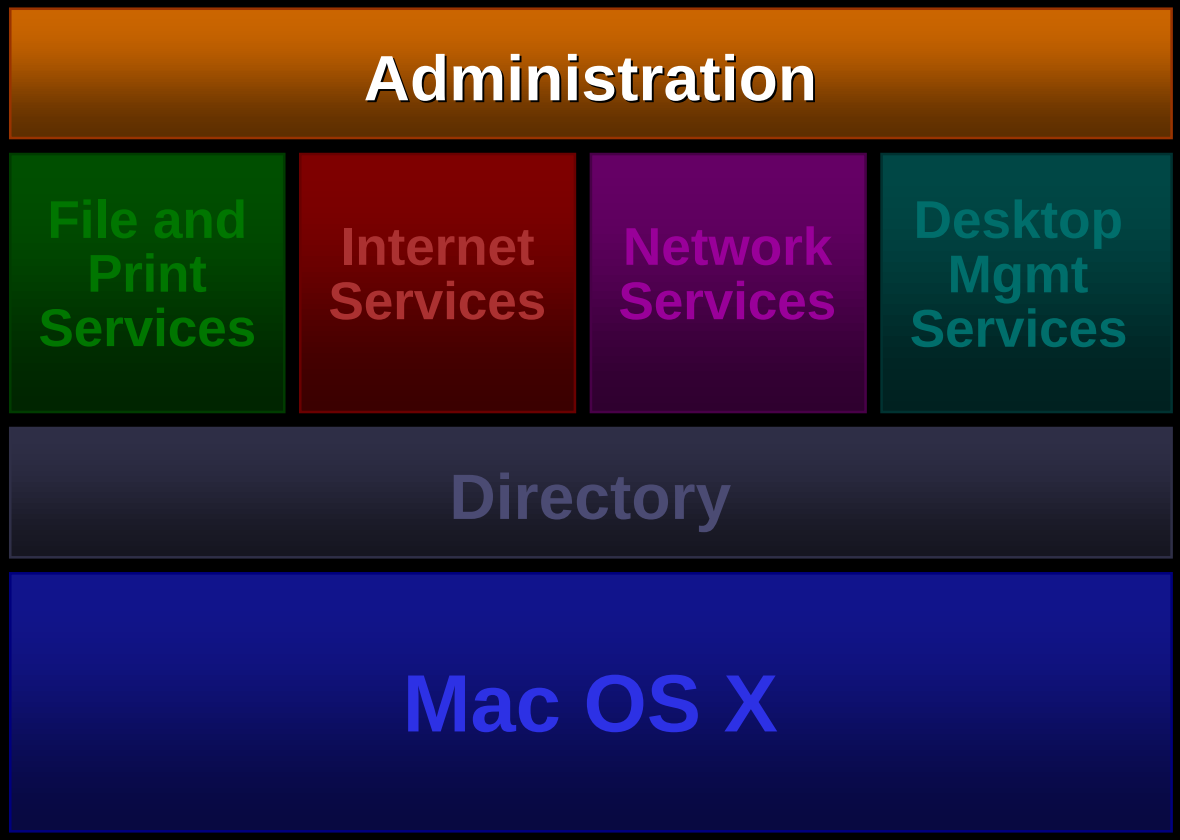
Internet Services—WebObjects

- Mac OS X Server includes WebObjects 5 deployment platform
- WebObjects is an Application Server supporting:
  - Cross-platform deployment
  - Desktop application support
  - Dynamic, database-driven content
  - Automated data access
  - Streamlined page generation
  - Integrated developer tools

Web Application Server



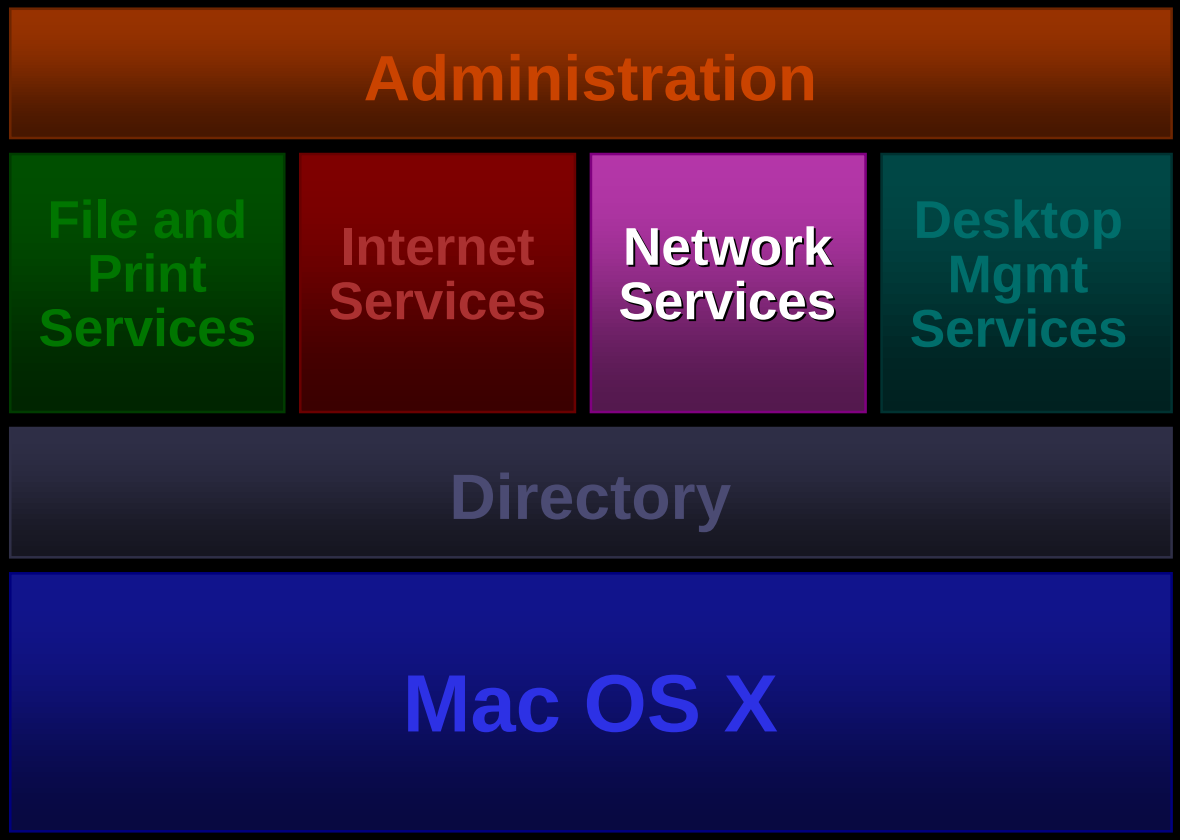
Administration



Administration

- Full Aqua UI for managing Mac OS X
- Administration of key services from one app!
- Very easy to use
- Remote or local—anywhere on the Internet
- Secure
- Administer multiple servers simultaneously

Network Services



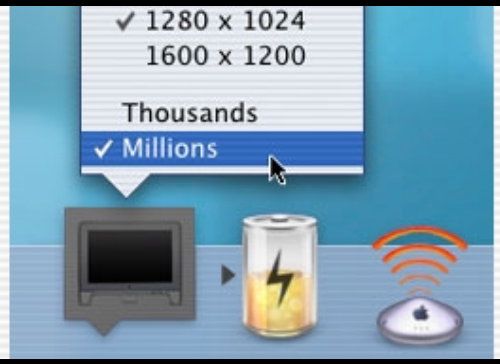
Network Services

- Mac OS X Server is standards based
- Protection with IP filtering
- Full DHCP implementation
  - Includes support for BootP and NetBoot
- Dynamic network resource location
  - SLP—Directory Agent
  - Based on SLP v2 specification
  - Multiple scopes and servers supported
- DNS—Bind 8.2 Protocol
  - Improved UI planned for future release

Desktop Management Services

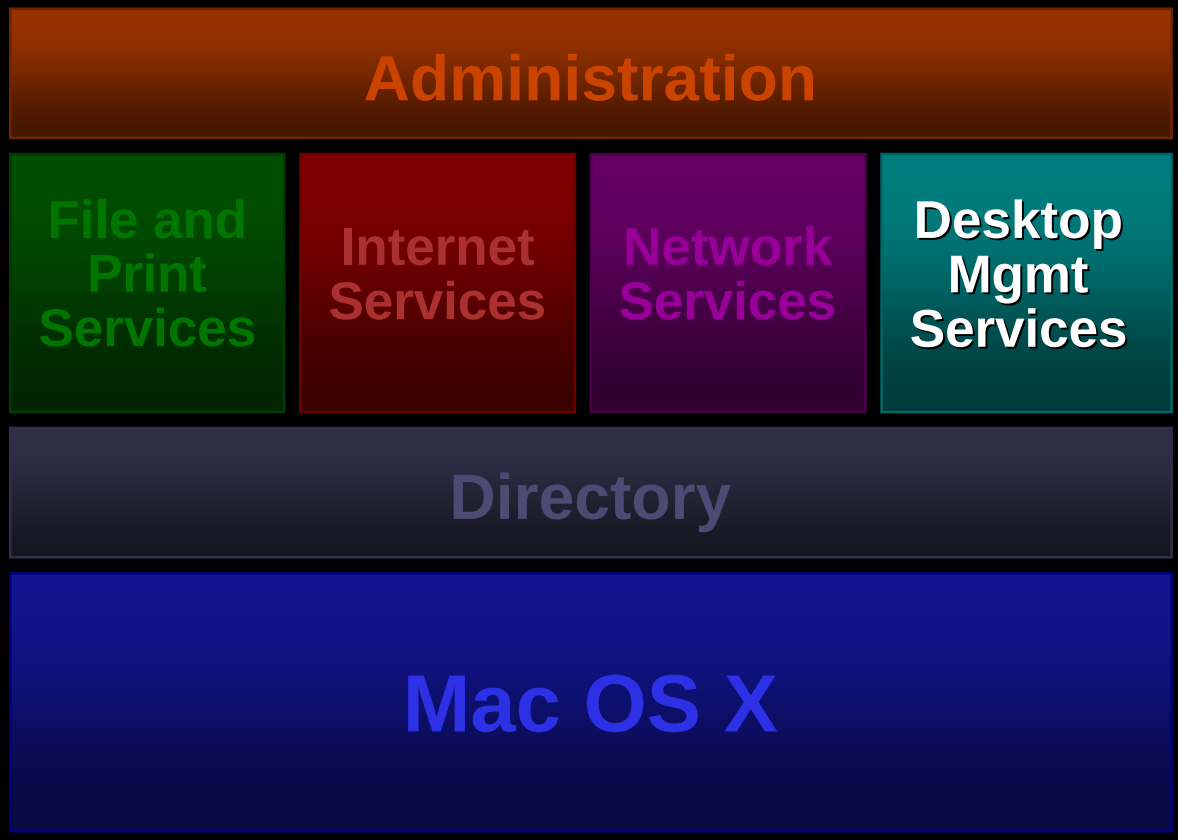
- Macintosh Manager
- NetBoot

Mac OS X Server
Desktop Management



Rob Neville
Desktop Management Solutions

Desktop Management Services



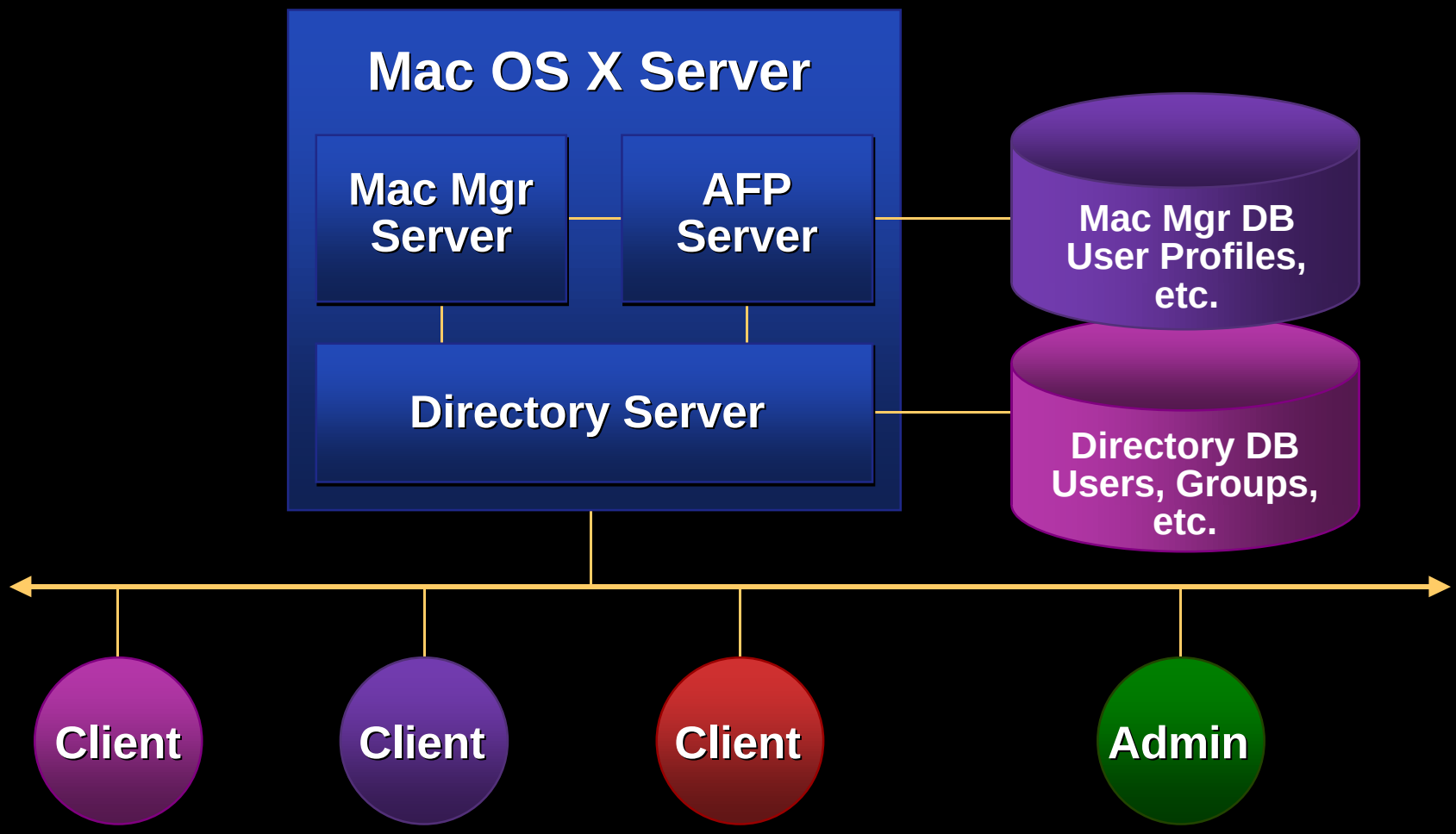
Macintosh Manager—Goals

- Simplify administration experience
- Work to integrate with industry standards
- Simplify user experience
- Mac OS X Administration
  - Mac OS 9 Admin client as well (Carbon)
- Compatibility
- Now use public Home Directories and common U&G on the server

Macintosh Manager—Details

- Single user name, password for all services
  - Users Mac OS X Server Users & Groups
- Alternative Authentication using directory services plug-ins at server
- Mac OS X user home directory
- Admin in Carbon for Mac OS 9 and Mac OS X
- Client support 8.1–9.X
- Kerberos support
- Designing applications—point to tech note

Mac Manager Architecture



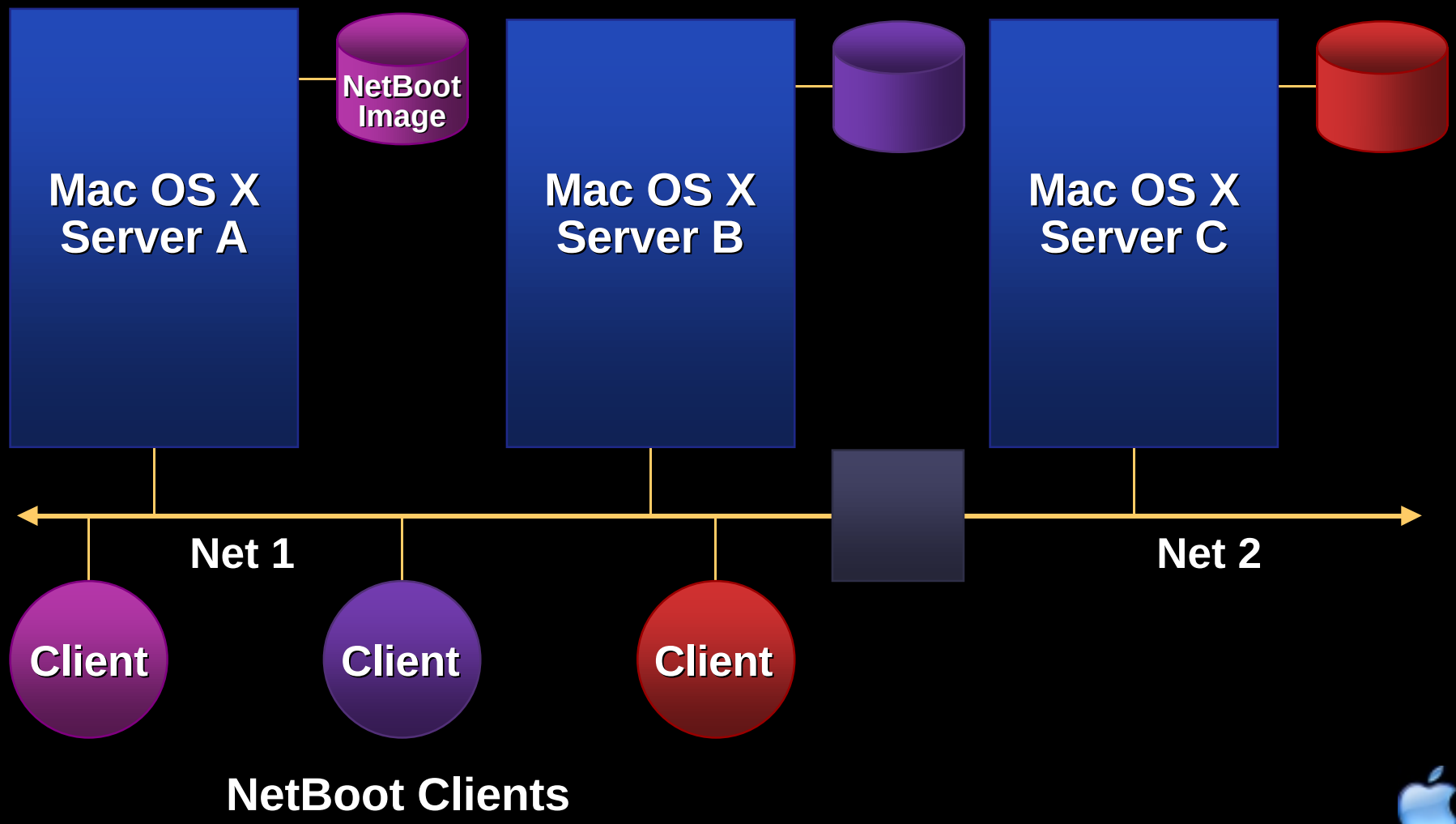
NetBoot—Goals

- Simplify workgroup administration
  - Multiple desktops share the same server-hosted boot image
  - Protected from user modification
  - Desktop OS updates become trivial
- Work with standard unmodified Mac OS 9
  - Mac OS 9 only
- Boot performance comparable to local disk

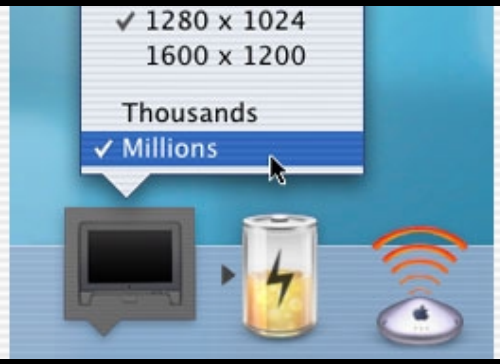
NetBoot—Details

- Upcoming improvements
  - Interoperates with standard DHCP servers
    - Interactions with other DHCP servers on the network
  - Highly scalable through multiple NetBoot servers
- Implications for developers
  - Assume “non-persistent” Mac OS

Sample NetBoot Installation



Developing for Mac OS X Server



Greg Vaughan
Senior Engineer, Mac OS X Server

Developing for Mac OS X Server

- Developing other services for Mac OS X Server
- Porting other Unix servers
- Things to watch out for
- Fitting in and adding value

Porting Unix Servers

- Case sensitive versus case insensitive file names
  - HFS is case insensitive, which can cause problems for Unix apps
  - Can run server on UFS
- Access to information in /etc
  - Many standard /etc files are replaced by info in NetInfo (or elsewhere)
  - Use APIs instead of reading files like /etc/passwd and /etc/fstab

Which APIs to Use

- Primarily write to Unix (Posix and BSD) APIs
  - Can add value with Mac OS X specific APIs
    - Directory Services
    - CoreFoundation
    - CarbonCore (File Manager)
- Beware of APIs outside of CoreServices

Fitting In

- Starting the server at boot time
  - /System/Library/StartupItems
  - Watchdog
- Admin User versus Root
  - Administrators are not root
  - Servers can run as root, users should only log in as administrators

File System Layout

- Files in standard Unix directories won't be visible from the Finder
  - Configuration files and log files
  - Move files or decide how administrators will access them
- Pay attention to directory permissions
  - Administrators don't have write access to some directories

Other Services

- Adding reliability with watchdog
  - Provides restart of crashed servers
  - Heartbeat restart
  - Man watchdog
- Using other authentication methods
  - Can use normal Unix crypt authentication
  - Directory services provides other authentication methods
    - SMB/CIFS
    - Extensible

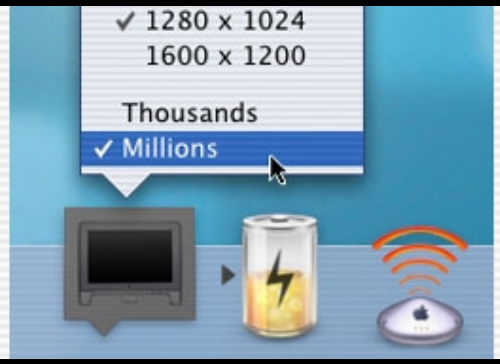
Development Tools

- Can use GUI tools (Project Builder), or normal command line tools
- Checking for Mac OS X Server versus Desktop
  - /System/Library/CoreServices/ServerVersion.plist
- Watch for long term reliability issues
  - MallocDebug

Related Sessions

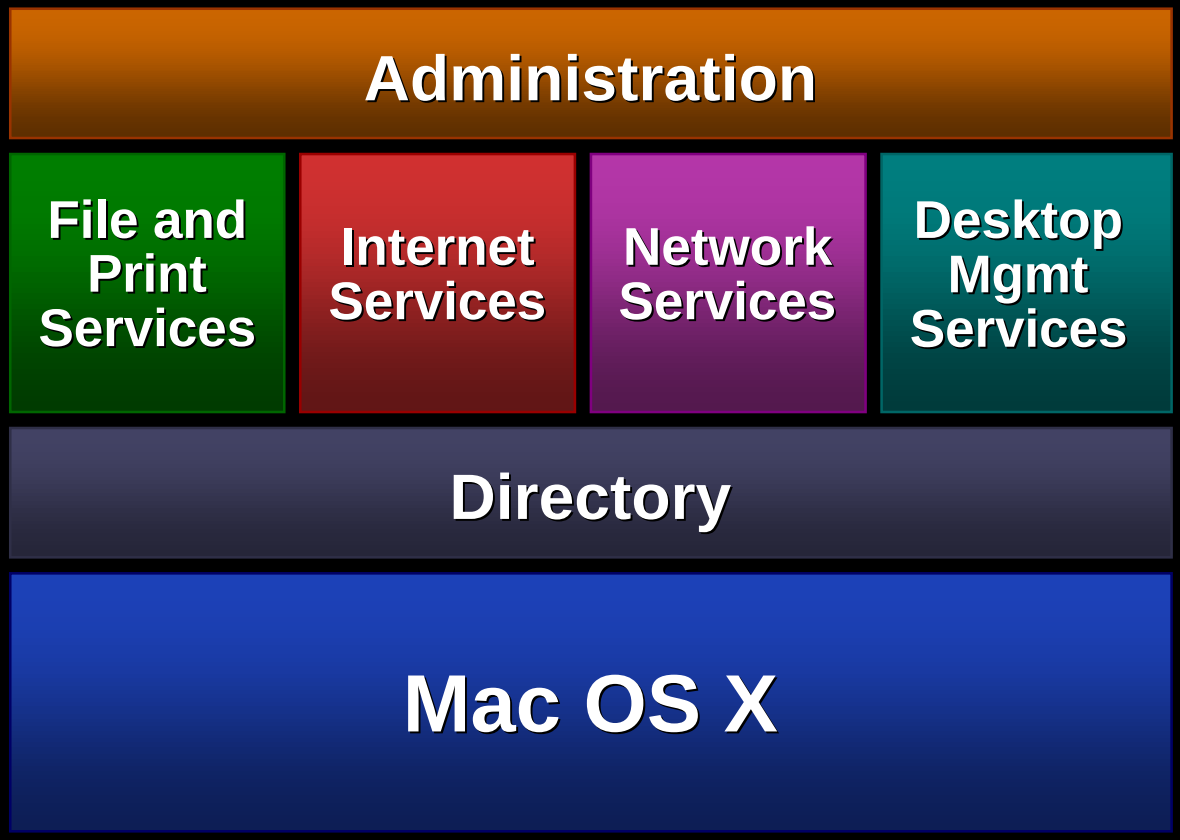
300 Networking Overview	Room A1 **Tues., 9:00am**
700 Mac OS X Tools Overview	Hall 2 **Tues., 10:30am**
306 Security: Authentication APIs	Room J2 **Wed., 10:30am**
308 Network Services Location	Room C **Wed., 5:00pm**
705 Apple Performance Tools	Room A2 **Thurs., 5:00pm**
706 Debugging on Mac OS X	Hall 2 **Fri., 9:00am**

Mac OS X Server Overview



Eric Zelenka
Product Line Manager, Server Software

Mac OS X Server Overview



Why Develop for Mac OS X Server?

- Mac OS X Server is Apple's server platform for the next generation
- Specifically designed to be a server
- Benefit from server-specific features
- Leverage the full power of UNIX and open source development projects

Key Developer Opportunities

- Directory Plug-ins for Interoperability
  - Kerberos
  - Windows Active Directory
  - Novell eDirectory, NDS
  - NIS, NIS+
- Server Management and Administration
  - Web-based management
  - Log analysis, reporting, history
  - Server monitoring
  - Backup and restore

Key Developer Opportunities

- Web interfaces and applications
  - Apache modules
  - WebObjects
  - Java Servlets
  - Database Middleware
- Server hardware solutions
  - RAID
  - Large storage arrays
  - Power management UPS
- High-end professional printing solutions

Roadmap

302 Directory Services	Room A1 **Tues., 3:30pm**
403 Broadcasting Live with QuickTime Streaming	Room A2 **Wed., 5:00pm**
FF 116 Feedback Forum: Mac OS X Server	Room J1 **Fri., 9:00am**
308 Network Services Location	Room C **Wed., 5:00pm**
309 Security: Kerberos	Room A2 **Thurs., 2:00pm**
310 AFP 3.0 & AppleShare Client on Mac OS X	Room J2 **Thurs., 3:30pm**

Roadmap

116 Mac OS X File System	Room J2 **Wed., 9:00am**
115 Open Source at Apple	Room A2 **Wed., 10:30am**
139 Leveraging BSD Services in Mac OS X	Civic **Fri., 2:00pm**
140 The Darwin Kernel	Civic **Fri., 3:30pm**
600–618 WebObjects	

Who to Contact

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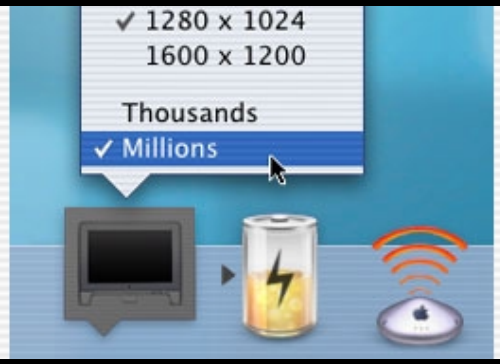
Q&A



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http://developer.apple.com/events/urls.html

WWDC

Worldwide Developers Conference 2001